

CLAIMS

1. A height-adjustable car curtain, comprising:
 - a curtain, made of soft, sun-protective material;
 - 5 a case, roughly shaped like a tube, having two ends, for housing said curtain in a folded state, having an opening in a longitudinal direction allowing said curtain to pass through;
 - a winding device for unfolding and folding said curtain;
 - a leading rod, attached to a far edge of said curtain;
 - 10 two guiding rails, at lower ends thereof connected with said two ends of said case, respectively, guiding said leading rod when said curtain is unfolded and folded, and allowing to be cut to suitable lengths for adapting to various sizes of car windows;
 - a cord, having a near end inside said winding device and
 - 15 far ends that are led through said case and said guiding rails and are connected with said leading rod for controlling unfolding and folding movements of said leading rod; and
 - two connecting elements, each of said two connecting elements connecting said case and one of said guiding rails and having
 - 20 a roll, over which one of said free ends of said cord is led, a joint, allowing to adjust an inclination angle of one of said guiding rails for adapting to various shapes of car windows.
2. The height-adjustable car curtain according to claim 1, wherein said case has a lower side with a groove housing two extension
- 25 rods which are respectively connected with said two connecting elements, allowing to adjust a distance between said two guiding rails for adapting to various widths of car windows.
3. The height-adjustable car curtain according to claim 1, wherein said leading rod has two ends, each of which carrying a gliding
- 30 rod having a far end, to which a gliding seat is hingedly connected, gliding inside one of said guiding rails.

4. The height-adjustable car curtain according to claim 1, wherein each of said guiding rails has an upper end with a wheel, over which one of said two free ends of said cord is led to minimize friction.

5 5. The height-adjustable car curtain according to claim 3, wherein each of said guiding rails has an inner passageway and a longitudinal slit, accommodating a gliding plate of said gliding seat.

6. The height-adjustable car curtain according to claim 1, wherein to each of said guiding rails on an upper end thereof a fastening element is attached.

10 7. The height-adjustable car curtain according to claim 6, wherein for each of said guiding rails said fastening element further comprises a gliding part and an elastic plate on said gliding part.

15 8. The height-adjustable car curtain according to claim 1, wherein for each of said connecting elements said roll is set on an axis mounted on said joint.

9. The height-adjustable car curtain according to claim 1, wherein each of said connecting elements has an insertion end, which is put into one of said guiding rails.

20 10. The height-adjustable car curtain according to claim 2, wherein each of said connecting elements has a fixed end, which is fastened to one of said extension rods.

11. A winding device for a height-adjustable car curtain, comprising:

a casing;

25 a motor, housed in said casing and driving a worm in a rotating movement;

a winding wheel, coaxially connected with a gear wheel which engages with said worm, thus being driven by said motor;

30 a control system, controlling said rotating movement of said motor, having a lever arm and a contact switch;

a control circuit; and

a cord, having a near end wound on said winding wheel and a far end which is led over said lever arm of said control system in a Z-shaped pattern and reaches out of said winding device;

5 wherein, when said far end of said cord is pulled on, said lever arm is shifted to press on said contact switch, resulting in said motor to remain switched on, and when said cord becomes slack, said lever arm moves away from said contact switch, so that said motor is switched off, preventing said cord from becoming tangled due to
10 excessive unwinding thereof.

12. The winding device for a height-adjustable car curtain according to claim 11, wherein said lever arm has an axis, allowing said lever arm to perform a swaying movement.

13. The winding device for a height-adjustable car curtain
15 according to claim 11, wherein said lever arm has two ends each of which carry a wheel over which said far end of said cord is led to minimize friction.

14. A control circuit for a height-adjustable car curtain, comprising:

20 a power circuit, supplying required power;
 a driver circuit, using transistors controlling switching on and off of a motor;

 a sensor circuit, detecting changes of electric current through said motor;

25 a timer circuit, controlling operation of said motor according to elapsed time as compared to a preset time interval;

 a high-frequency receiver and a memory device, receiving and storing UP and DOWN control signals from a remote control device for remote controlling;

a main control circuit, receiving signals from said sensor circuit and said timer circuit and generating signals for controlling operation of said motor or performing control in an exceptional state according to stored UP and DOWN control signals received by said high-frequency receiver and stored in said memory device;

an alarm circuit, issuing an alarm in said exceptional state;

wherein, when under manual control a car curtain has been completely unfolded and said sensor circuit senses an increased electric current through said motor, while said timer sensor has not sensed elapsed time having reached said preset time interval, said main control circuit causes said motor to be switched off; when said sensor circuit senses no increased electric current through said motor and said timer sensor has sensed elapsed time having reached said preset time interval, said main control circuit causes said motor to be switched off; and when elapsed time has not yet reached 90% of said preset time interval and an exceptional state due to blocking of said car curtain has occurred, said sensor circuit sends a signal to said main control circuit, which subsequently causes said motor to stop and then to move in reverse direction to reach a previous state; and wherein under remote control first a signal received from said remote control device by said high-frequency receiver is stored in said memory device as an UP or DOWN control signal, with subsequent signals received from said remote control device by said high-frequency receiver being used to control movements of said car curtain.

15. The control circuit for a height-adjustable car curtain according to claim 14, wherein said sensor circuit detects changes of electric current through said motor due to blocking of a movement of said car curtain.

16. The control circuit for a height-adjustable car curtain according to claim 14, wherein said sensor circuit and said timer circuit are connected to each other, so that changes of electric current through said motor and elapsed time are simultaneously monitored.

17. The control circuit for a height-adjustable car curtain according to claim 14, wherein, when said timer circuit senses that elapsed time has not yet reached 90% of said preset time interval and said sensor circuit senses an of electric current through said motor, a signal is sent to said main control circuit, which subsequently causes said motor to stop and then to move in reverse direction.